PROJECT DESCRIPTION
JVR SOLAR PROJECT/PHOTOVOLTAIC SOLAR FARM
JACUMBA, CALIFORNIA

PROJECT LOCATION

The proposed Jacumba Valley Ranch (JVR) Solar Project (proposed "Project") site is located in the community of Jacumba, California, in southeastern San Diego County. Interstate 8 (I-8) generally trends east-west just to the north of the northern property boundary, with Old Highway 80 running east-west through the southern portion of the property. The County Assessor Parcel Numbers (APNs) are 614-100-20 & -21; 614-110-04; 660-020-05 & -06; 660-150-04, -07, -08, -10, -14, -17 & -18; 660-170-09; 661-010-02, -15, -26, -27 & -30; and 661-060-12 & -22 which total approximately 1,289 acres. Refer to Figure 1, Regional/Local Vicinity Map.

PURPOSE AND NEED

The Project is intended to allow for the installation and operation of a photovoltaic (PV) solar electrical generation facility and represents an opportunity to provide residents of Jacumba and the greater surrounding area with a clean source of electrical power from renewable energy sources. Power generated by the Project would replace a portion of the energy currently supplied to the power grid by non-renewable sources located far away from Jacumba, which require transmission lines to delivery power to the Jacumba area. The proposed Project would instead deliver renewable energy to the State of California electrical service customers in the cleanest, most efficient manner possible.

EXISTING CONDITIONS

Surrounding Land Use

The majority of lands surrounding the Project site are largely undeveloped. The town of Jacumba is located to the southwest of the site, generally focused on lands located north of Old Highway 80. Development within the town typically consists of rural residential uses and small-scale retail stores and services. Limited small-scale active and fallow agricultural uses are also present on a number of surrounding lands. A gas station is located along Carrizo Gorge Road adjacent to the northeastern property boundary. Pound Mountain lies just west of the northwestern property boundary; Gray Mountain lies just to the north across I-8. The East County (ECO) Substation, operated by SDG&E, is located approximately 2.1 miles to the east of the site. There is a newly constructed 20 megawatt (MW) photovoltaic solar plant located adjacent to the ECO Substation on approximately 103 acres.

The Jacumba Valley Airport is located just south of Old Highway 80, and directly south and east of the southernmost portion of the proposed development area. The subject site is located within

the boundaries of the Airport Land Use Compatibility Plan (ALUCP) for the airport and is within the Airport Influence Areas (Review Areas 1 and 2) which is affected by issues such as noise, safety, airspace protection, and overflight protection. The Jacumba Valley Airport ALUCP is used by the San Diego County Regional Airport Authority (SDCRAA), acting in its capacity as the San Diego County Airport Land Use Commission (ALUC), in fulfilling its purpose of promoting airport land use compatibility. Additionally, the United States/Mexico international border lies just south of the Jacumba Valley Airport.

Onsite Conditions

The site is largely undeveloped with exception of several small abandoned structures in the southern portion of the site that were associated with former agricultural uses. These structures would be removed with the Project to allow for installation of the PV solar facilities. A number of existing gravel and dirt roadways traverse portions of the property. Several operational groundwater wells are present onsite and can produce water for construction and operational use.

The site supports a variety of habitat, but is largely dominated by Sonoran mixed woody scrub, field/pasture land, Colorado desert wash scrub, and alkali seep. Other habitat present includes urban/developed, encelia scrub, acacia scrub, southern riparian forest, mesquite bosque, and desert saltbrush scrub, among others; refer to Appendix A, Biological Resources Memorandum. The site has been utilized for agricultural purposes in the past; however, such lands now lie fallow. Lands designated as Prime Farmland, Farmland of Statewide Importance, and Unique Farmland, as defined by the California Department of Conservation Farmland Mapping and Monitoring Program (FMMP), are present on portions of the property.

The general topography of the site is gently rolling. The elevation range within the study area is from 2,720 feet to 3,360 feet above mean sea level (amsl). Steep slopes (rise greater than 25% over a 50-foot run, as defined by the County's Resource Protection Ordinance) are present in the northwestern, western, northern, and southeastern portions of the property.

An existing easement for the Carrizo Gorge Railway enters the southwestern portion of the site at the western boundary, running generally east-west then turning northward and exiting the northwestern corner of the property near I-8. An existing SDG&E easement also traverses the central portion of the site from east to west. Several large-scale SDG&E transmission towers are present within the easement.

COUNTY OF SAN DIEGO GENERAL PLAN LAND USE DESIGNATIONS AND ZONING

Existing County General Plan land use designations for the affected parcels is Specific Plan Area and Rural Residential (RL-40). Existing zoning for the affected parcels is S80 (Open Space), S88 (Specific Plan), and S92 (General Rural).

The County of San Diego General Plan was adopted on August 3, 2011 by the County Board of Supervisors. The Project would be designed in conformance with applicable goals and policies given in the General Plan as well as the Mountain Empire Subregional Pan, which is part of the County's General Plan, identifies goals and policies at the community level that may affect the Project.

PROPOSED PROJECT

The Project proponent is preparing an application for development and operation of a (approximately) 100 MW alternating current (AC) photovoltaic solar farm to be located on privately-held lands near Jacumba. The Project requires discretionary approval from the County of San Diego to allow for the construction, operation, and maintenance of such facilities for the long-term generation of solar energy.

The proposed PV solar facilities would be installed on a portion of the approximately 1,289-acre property. The fenced boundary of the proposed development area would encompass approximately 571 acres and would include the solar field plus proposed perimeter landscaped screening areas. The unaffected (undeveloped) acreage onsite would remain in its present state upon implementation of the proposed Project as currently designed.

Under existing conditions, access to the site is from Old Highway 80. Minor improvements are proposed to this access drive to provide primary access to the Project site. Secondary access will be provided from Carrizo Gorge Road which forms a portion of the eastern property boundary. No offsite roadway improvements are anticipated; however, minor improvements may be required along the frontage for purposes of access and/or sight distance requirements.

The Project design would consist of PV solar panels mounted on a collection of single-axis tracking (SAT) systems supported by machine-driven metal "H" piles or round pipe columns. The single-axis system proposes solar panels aligned in rows that rotate to face east in the morning and west in the afternoon hours, tracking the sun about a north/south axis to maximize solar absorption.

The PV panels would be mounted on a single-axis tracker. It is anticipated that the center axis of the single-axis trackers would have a nominal height of three feet above grade. The PV panels would rotate through a 90-degree arc during the day. The maximum anticipated height of the top of panel would measure an average of seven feet at full tilt. In certain cases where the ground surface undulates underneath the panels, the height of the top of panel could reach a maximum of approximately 12 feet (as measured from the ground surface); however, when viewed, the top of the panels would appear to the viewer to generally maintain a consistent height across the horizon.

The direct current (DC) power generated by the PV panels would be transmitted via underground cable to proposed inverter/transformer pads located within the proposed onsite development

area where the 1,500 Volt DC power would be converted to 480 volts AC power and then would be stepped up to 34,000 volts AC (34kV AC) with a transformer.

All inverter/transformer and switchgear structures would be constructed of non-flammable materials (e.g. steel). The 34kV AC power from the inverter stations would be transmitted via underground AC cable to the onsite private substation. The substation would contain a 138,000 Volt AC step up transformer, control house, switches, breakers, relays, and monitoring and metering equipment necessary to provide for the safe and efficient transfer of power to the grid. From the onsite substation, the Project would either interconnect directly into the 138kV transmission line located adjacent to the substation or would have a generator tie line back to the Eco Substation as described below.

Energy Storage: The Project also includes 20 MW of onsite energy storage as an ancillary component. The selected technology is lithium Ion batteries provided in in a self-contained steel container measuring 40 feet x 8.5 feet x 9.5 feet (LxWxH). Each battery storage container is rated for 1 MW AC for up to four hours (4 MWhrs) of discharge as needed by the utility. Each container would be spread out throughout the facility and located adjacent to the PV inverter skid. The energy would be collected and discharged on the low voltage DC side of the system. Alternatively, the 20 containers could be located adjacent to the onsite substation for an AC coupling by using a bidirectional inverter. Each energy storage container would have an air conditioning system to control thermal runaway and a fire suppression system.

Additional Components: Installation of a 6-foot high chain-link fence (plus one foot of 3-strand barb wire) is proposed along the perimeter of the development area for security purposes.

A 20-foot wide landscaped strip is proposed along the Project frontage onto both sides of Old Highway 80 for screening purposes. Additionally, a landscaped buffer would be planted along portions of the north/northeastern property frontage onto Carrizo Gorge Road and along portions of the western boundary of the development area. Only native, drought-tolerant plants would be used to minimize irrigation requirements and reduce the potential for the spread of wildfire.

Several groundwater wells are present onsite; refer to Appendix B, Groundwater Resources Memorandum. It is anticipated that water for purposes of panel washing, dust control, and irrigation of Project landscaping would be supplied by the existing groundwater wells. The Project site lies within the service boundaries of the Jacumba Community Service District for water service. Therefore, if public water service is used for the Project, annexation into a district for water service would not be required. The extension of water lines to serve the site is not proposed at this time.

The site will be unmanned. One operations and maintenance (O&M) building is proposed onsite in support of routine and ongoing maintenance activities. The O&M building will be constructed as an approximate 100-foot by 100-foot tilt-up concrete structure. Additional building details will be provided in the permit application.

ACCESS / CIRCULATION

Construction Access

All materials for Project construction would be delivered to the site by truck. The majority of truck traffic would occur on designated truck routes and/or major streets (e.g., Old Highway 80 and /or Carrizo Gorge Road). Traffic resulting from construction activities would be temporary and may occur along area roadways as workers and materials are transported to and from the Project area. If directed by the County, and prior to the issuance of a grading/building permit, the Project applicant would prepare a traffic control plans to ensure that circulation on the affected roadways is not adversely affected and that public safety is maintained.

Long-Term Access and Onsite Circulation

Primary access to the site is proposed from Old Highway 80 (two points of access to serve proposed development north and south of the roadway), with secondary access from Carrizo Gorge Road. Onsite, a 24-foot wide perimeter road is anticipated to encircle the development area(s) to provide access to the inverters and to serve as access for emergency (fire protection) vehicles. Interior access roads running within the solar fields would be a minimum of 20 feet wide and designed per governing County standard design specifications. All fire access roads would be designed with an all-weather surface (decomposed granite or gravel) and capable of supporting a minimum 50,000-pound fire apparatus bearing load. These drives would also be used for purposes of Project maintenance. A series of smaller native compacted 10-foot wide roadways would be provided within the solar PV field to provide access for maintenance vehicles.

LIGHTING

Limited Project lighting would be installed to allow for security. At a minimum, permanent lighting would be provided for the enclosure interiors; outdoor equipment access areas, such as at the inverters and switchgear; and, at the site entrance. Low-level lighting would be installed at the proposed entry gates to facilitate access.

All lighting would be operated manually or activated via motion sensors and would be shielded and directed downward to minimize the potential for glare or spillover onto adjacent ownerships. All lighting would conform to County of San Diego outdoor lighting requirements. All outdoor lighting controls would incorporate dusk-to-dawn photocell controllers, occupancy sensors, and/or switches as appropriate. Lighting levels shall be as recommended in Illuminating Engineering Society (IES) standards. Suitable fixtures would be specified and installed according to the hazardous area classification, if applicable.

GRADING

The PV solar panels would be installed in parallel rows running north/south. Portions of the proposed development area would require grading and/or would be cleared and grubbed to allow for installation of the panels and associated facilities.

PHASING

Construction phasing details will be provided in the permit application.

OPERATION, SECURITY, AND MAINTENANCE

The facilities would be unmanned and monitored remotely. Once the solar panels are installed, the panels would operate during daylight hours, seven days per week, and 365 days per year. Security would be maintained through installation of a 6-foot high chain-link fence (plus one foot of 3-strand barb wire) around the perimeter of the proposed development area. As stated above, one O&M building will be erected onsite.

Gates would be installed at the proposed entrances on Old Highway 80 and Carrizo Gorge Road for security. Each would be a double gate of 24 feet in width. The gates would be equipped with a strobe light activation and Knox box key-operated switch to allow for access by emergency personnel.

Video cameras (one at each corner of the property) would be strategically installed on the security fence for surveillance of most of the development area. The video cameras would utilize an internet-based communications system via a phone line or cellular system.

Signage would be installed include system identification, safety, and warning signs. Signage would be located throughout the development area in accordance with applicable Occupational and Safety and Health Administration (OSHA) requirements and as required by the Authority Having Jurisdiction.

It is anticipated that maintenance of the facilities would require occasional visual inspections and minor repairs. Overall, minimal maintenance requirements are anticipated, as the panels would operate on their own with little human involvement required. On intermittent occasions, the presence of several workers may be required if major repairs or replacement of equipment is required; however, due to the nature of the facilities, such actions are anticipated to be infrequent. Occasional equipment replacement or refurbishing may also be conducted. To allow for ongoing maintenance, it is anticipated that the PV solar panels would be washed twice per year. As stated above, water for the Project would be provided via onsite groundwater wells.

UTILITIES

Water

Construction

Water for construction would be provided by the onsite groundwater wells and conveyed to proposed onsite water storage tanks. Initial construction occurring within the first two months would include brushing/clearing, grading, trenching, post installation, and onsite access road construction. The remainder of the construction period would include racking, module, and combiner installation; module wiring; and, final testing/commissioning. A permeable soil-binding agent would be applied during construction to stabilize onsite disturbed soils to reduce fugitive dust.

Operation and Maintenance

Water would be required every year for maintenance activities related to dust suppression purposes. Water would also be required for irrigation of the proposed landscaping to be planted for screening purposes (e.g., along Old Highway 80, Carrizo Gorge Road). Irrigation of the landscaping would be required for until successful establishment of the plantings occurs. Water for purposes of dust control and landscape irrigation would be provided by the onsite groundwater wells.

In addition, it is anticipated that the PV solar panels would be washed twice per year to remove dust particles and other buildup to ensure optimum solar absorption. Water from the onsite groundwater wells would be used for the panel washing. Actual amounts of water proposed will be provided in the permit application. Refer also to Appendix B, Groundwater Resources Memorandum.

Stormwater/Drainage

A significant increase in stormwater runoff or treatment needs from the areas affected by the Project is not anticipated to occur. Stormwater runoff in areas where facilities would be installed would remain generally unchanged following construction. In addition, the solar panels and supporting structures would occupy a minimal building footprint on the affected property and would not require or result in a significant change in existing conditions with regard to storm water runoff or treatment needs. As applicable, stormwater runoff and treatment would be adequately handled through the implementation of onsite best management practices (BMPs) and/or other design measures and would not result in or require significant changes to existing offsite storm drain facilities. The existing drainages located onsite would be preserved to the extent feasible to maintain existing drainage patterns.

Other Utilities

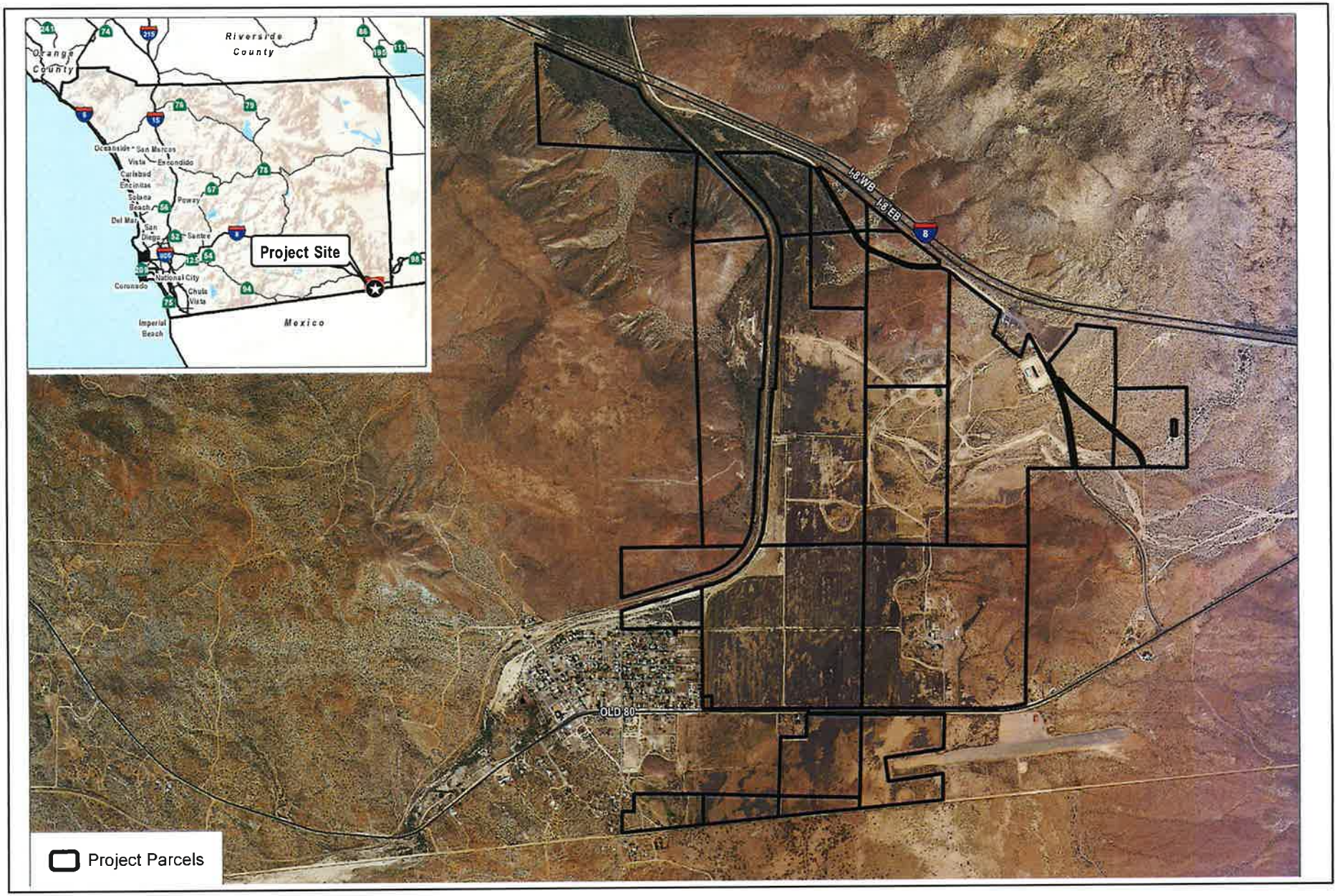
The site would be unmanned and therefore, the Project would not require connection to a public sewer system or water system. Electric and propane gas service are currently available to the Project site. The proposed Project would generate electricity via the PV solar panels. The use of natural gas is not anticipated with Project construction or operation.

PUBLIC SERVICES

Fire Protection Services

The Project site is within the service boundaries of the San Diego County Fire Authority (SDCFA) and Community Service Area (CSA) 135. The Project would be served by the Rural Fire Protection District (RFPD) from Station 43, located at 1255 Jacumba Street in Jacumba.

Project design provides for a 30-foot wide fire management zone (FMZ) along the perimeter of the onsite development area (inside the proposed chain-link fencing) to ensure brush removal and to reduce the potential for wildfire to occur and/or spread. Water for fire protection purposes would be provided via a proposed water line that would allow for extraction from the onsite groundwater wells. Water storage tank(s) are proposed onsite to ensure that an adequate water supply is available in the event of a wildfire.



Source: Dudek, 2017

Michael Baker INTERNATIONAL

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163279Exhibits.indd

JVR Solar Project ▪ San Diego County, California

REGIONAL/LOCAL VICINITY MAP

Figure 1

Attachment A

Biological Resources Memorandum

DUDEK

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MEMORANDUM

To:	Patrick Brown, BayWa Renewable Energy
From:	David Hochart, Dudek
Subject:	Biological Analysis for Jacumba Valley Ranch, San Diego County, California
Date:	November 10, 2017
cc:	Brock Ortega (Dudek)
Attachment(s):	Figures 1–3; Appendices A–B

This memorandum documents the results of biological resources literature review conducted by Dudek biologists in November 2017 within a 1,289-acre study area at Jacumba Valley Ranch site located in eastern San Diego County, California. This letter report is intended to describe the existing conditions of biological resources and potential biological constraints within the study area in terms of vegetation, flora, and fauna.

1 INTRODUCTION

1.1 Project Description and Location

The Jacumba Valley Ranch is planned for the development of approximately 100 MW's of solar energy facilities to be constructed on approximately 1,289 acres located south of Interstate 8 (I-8) within private lands located adjacent to the US/Mexico Border.

The 1,289-acre study area is located south of Interstate 8 (I-8) within private lands located adjacent to the US/Mexico Border in eastern San Diego County, California (Figure 1, Regional Location Map). The study area is situated south and west of Carrizo Gorge Road and immediately north of the US/Mexico Border. The study area lies within the Jacumba U.S. Geological Survey (USGS) 7.5-minute quadrangle, Townships 17 South and 18 South, Range 8 East, Sections 4, 5, 8, 9, 32, 33 (Figure 1, Project Location).

1.2 Existing Conditions

The general topography of the site is gently rolling. The site has been previously disturbed for agricultural purposes. The elevation range within the study area is from 2,720 feet to 3,360 feet above mean sea level. Soils mapped on site include Acid igneous rock land; Carrizo very gravelly sand, 0 to 9% slopes; Indio silt loam, 0 to 2% slopes, 2 to 5% slopes, and saline, 0 to 2% slopes; La Posta rocky loamy coarse sand, 5 to 30% slopes, eroded; Ramona sandy loam, 5 to 9% slopes, and

9 to 15% slopes, eroded; Reiff fine sandy loam, 0 to 2% slopes; Rositas loamy coarse sand, 2 to 9% slopes; sloping guilled land; and stony land (USDA 2017).

2 METHODS

2.1 Literature Review

To assess biological resources and potential constraints, Dudek reviewed available relevant literature and data on sensitive habitats and species distribution to determine those resources that have the potential for occurrence within approximately 5 miles of the project site (i.e., biological study area). Other appropriate and available biological documentation, surveys, and published research and maps were compiled, reviewed, and analyzed.

A literature review was conducted to evaluate the environmental setting of the study area and identify potential special-status biological resources that may be found on the site. The review included the following:

- California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB) (CDFW 2017) including USGS quads Jacumba, Carrizo Mtn; Sweeney Pass; Sombrero Peak, In-ko-pah Gorge, Live Oak Springs, and Tierra del Sol;
- California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants (CNPS 2017) for the Cucamonga Peak and surrounding 7.5-minute USGS quadrangles;
- U.S. Fish and Wildlife Service (USFWS) database (USFWS 2017a);
- U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey (USDA 2016a) was evaluated for the potential to support rare vegetation communities, plants, and/or wildlife;
- MSCP County of San Diego Subarea Plan (County of San Diego 1997);
- *County of San Diego Guidelines for Determining Significance and Report Format and Content Requirements: Biological Resources* (County of San Diego 2010a);
- *County of San Diego Multiple Species Conservation Program South County Subarea Plan Annual Report* (County of San Diego 2010b);
- Google Earth (2017);
- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (USFWS 2017b).

2.2 Vegetation Mapping

Vegetation communities were evaluated on an aerial map at a 200-scale (1 inch = 200 feet). These boundaries and locations were digitized and downloaded by Dudek Geographic Information Systems (GIS) technician using ArcGIS software. Vegetation communities and land covers were mapped using the Preliminary Descriptions of the Terrestrial Natural Communities of California (Holland 1986) as modified by the County and noted in Vegetation Communities of San Diego County (Oberbauer et al. 2008). The entire project site was analyzed.

2.3 Plants and Wildlife

All plant species encountered during the literature review were recorded. Latin and common names for plant species with a California Rare Plant Rank (CRPR; formerly CNPS List) follow the *California Native Plant Society On-Line Inventory of Rare, Threatened, and Endangered Plants of California* (CNPS 2017). For plant species without a CRPR, Latin names follow the *Jepson Interchange List of Currently Accepted Names of Native and Naturalized Plants of California* (Jepson Flora Project 2016) and common names follow the United States Department of Agriculture (USDA) Natural Resources Conservation Service Plants Database (USDA 2014).

Expected wildlife use of the Project Area was determined based on known habitat preferences of local species and knowledge of their relative distributions in the area. Latin and common names of animals follow Crother (2012) for reptiles and amphibians, American Ornithologists' Union (AOU 2016) for birds, North American Butterfly Association (NABA 2016) for butterflies, and Wilson and Reeder (2005) for mammals.

2.4 Jurisdictional Aquatic Resources

Jurisdictional aquatic resources were reviewed and analyzed according to the USFWS National Wetlands Inventory (USFWS 2017b). Jurisdictional aquatic resources, including both wetlands/riparian areas and non-wetland waters/streambeds, are mapped in the study area.

The Project is located within the Anza-Borrego watershed in San Diego County (USFWS 2017b). These areas occur along portions of a riverine, which flows roughly in a north-south direction, eventually running east-west along the US/Mexico Border.

3 RESULTS

3.1 Vegetation Mapping

Fifteen vegetation communities and/or land covers occur within the study area, including fourteen sensitive communities (County of San Diego 2010a). The acreages of vegetation communities and

land covers in the study area are listed in Table 1 and their distribution on site are shown on the biological resources map (Figure 2, Biological Resources).

Table 1
Vegetation Communities and Land Covers

Vegetation Community or Land Cover	Code	Acres	Typical County Mitigation Requirement
Sensitive Upland Communities			
Sonoran Mixed Woody Scrub	33210	385.64	2:1
Sonoran Mixed Woody and Succulent Scrub	33220	34.88	2:1
Colorado Desert Wash Scrub	33300	110.26	2:1
Encelia Scrub	33600	1.21	2:1
Acacia Scrub	33700	49.69	2:1
Desert Saltbush Scrub	36110	60.60	2:1
Semi-Desert Chaparral	37400	110.25	3:1
Upper Sonoran Subshrub Scrub	39000	24.00	1:1
Sensitive Upland Communities Subtotal		*776.53*	-
Jurisdictional Aquatic Resources			
Alkali Seep	45320	171.81	3:1
Southern Riparian Forest	61300	6.33	3:1
Mesquite Bosque	61820	7.38	3:1
Desert Dry Wash Woodland	62200	0.02	3:1
Freshwater	64140	0.88	3:1
Jurisdictional Aquatic Resources		*186.43*	-
Non-Sensitive Communities and Land Covers			
Urban/Developed	12000	39.23	NA
Field/Pasture	18310	275.18	0.5:1
Non-Sensitive Communities and Land Covers		*314.41*	-
Total		**1,289.37**	-

3.1.1 Sonoran Mixed Woody Scrub (33210)

Sonoran mixed woody scrub is characterized as being predominantly woody shrubs, 0.5 to 3 meters tall, and includes a mixture of three or more woody species (Oberbauer et al. 2008). Characteristic species include creosote bush (*Larrea tridentata*), white bursage (*Ambrosia dumosa*), and brittle bush (*Encelia farinosa*). In San Diego County, this vegetation community commonly occurs on lower alluvial fans, above the desert floor, and below the coarse mountain substrates (Oberbauer et al. 2008).

3.1.2 Sonoran Mixed Woody and Succulent Scrub (33220)

Sonoran mixed woody and succulent scrub occurs in the Colorado Desert and is dominated by 0.5 to 3 meter shrubs and cacti and other stem succulents (Oberbauer et al. 2008). Common characteristic species include desert agave (*Agave deserti*), brittle bush, and Mojave yucca (*Yucca schidigera*). In San Diego County, this vegetation community is dominated by more than 50% cover of succulent species (Oberbauer et al. 2008).

3.1.3 Colorado Desert Wash Scrub (33300)

This vegetation community is no long included in Oberbauer's (2008) *Draft Vegetation Communities of San Diego County*. However, Colorado desert wash scrub was classified in the 1996 draft (Oberbauer et al. 1996). Colorado desert wash scrub is located in dryer parts of desert streams and is characterized as a desert wash with shrubby vegetation. Characteristic species include singlewhorl burrobrush (*Ambrosia monogyra*), chuparosa (*Justicia californica*), and desert lavender (*Condea emoryi*).

3.1.4 Encelia Scrub (33600)

Encelia scrub is characterized as a low desert scrub community dominated by brittle bush (Oberbauer et al. 2008). This vegetation community occurs on desert slopes and alluvial fans. Brittle bush composes more than 50% cover, and includes other desert species. Additional characteristic species include ocotillo (*Fouquieria splendens*) and creosote bush. In San Diego County, Encelia scrub occurs on the lower steep east desert escarpment and alluvial fans (Oberbauer et al. 2008).

3.1.5 Acacia Scrub (33700)

Acacia scrub is characterized by a shrub community dominated by Catclaw acacia thorn (*Senegalia greggii*), including at least 50% relative cover (Oberbauer et al. 2008). This vegetation community occurs on slopes where it grads into Sonoran wash scrub, mesquite stands, and phases of chaparral.

3.1.6 Desert Saltbush Scrub (36110)

Desert saltbush scrub is characterized by widely spaced low, microphyllous 0.3 to 1 meter tall shrubs dominated by allscale (*Atriplex polycarpa*) and alkali goldenbush (*Isocoma acradenia*) (Oberbauer et al. 2008). This vegetation community commonly occurs on fine-textured, poorly drained soils with high alkalinity in drier areas. Characteristic species include silverscale saltbush (*Atriplex argentea*), fourwing saltbush (*Atriplex canescens*), and spiny hop sage (*Grayia spinosa*).

3.1.7 Semi-Desert Chaparral (37400)

Semi-desert chaparral is characterized by open, 1.5 to 3 meter sclerophylls found in dry, rockier soils or recently burned sites (Oberbauer et al. 2008). Characteristic species include chamise (*Adenostoma fasciculatum*), bigberry manzanita (*Arctostaphylos glauca*), and wedge leaf ceanothus (*Ceanothus cuneatus*). This vegetation community occurs on the high desert plateaus and escarpment of the Peninsular Range in San Diego County (Oberbauer et al. 2008).

3.1.8 Upper Sonoran Subshrub Scrub (39000)

Upper Sonoran subshrub scrub is characterized by low, soft-wooded, summer-dormant shrubs with annuals spread in between (Oberbauer et al. 2008). This vegetation community consists of fairly well drained soils derived from sandstone, shale, or sterile white diatomaceous deposits, and occurs at high elevations in San Diego County. Characteristic species include narrowleaf goldenbush (*Ericameria linearifolia*), California buckwheat, bladderpod spiderflower (*Peritoma arborea*), and California joint fir (*Ephedra californica*).

3.1.9 Alkali Seep (45320)

Alkali seep is characterized by low-growing perennial herbs in permanently moist or wet alkaline seeps (Oberbauer et al. 2008). Characteristic species include salt grass (*Distichlis spicata*), spiny naiad (*Najas marina*), boraxweed (*Nitrophila occidentalis*), and San Diego marsh-elder (*Iva hayesiana*). In San Diego County, alkali seep commonly occurs in desert regions as part of narrow drainages or springs.

3.1.10 Southern Riparian Forest (61300)

Southern riparian forest is characterized by a dense forest found along streams and river dominated by riparian species (Oberbauer et al. 2008). Characteristic species include California sycamores (*Platanus racemosa*) and willow species (*Populus* spp.), as well as oaks species (*Quercus* spp.).

3.1.11 Mesquite Bosque (61820)

Mesquite Bosque is characterized by an open to fairly dense, drought-deciduous streamside thorn forest with open annual and perennial grass understory (Oberbauer et al. 2008). This vegetation community is dominated by mesquite (*Prosopis glandulosa*) and additional characteristic species include carelessweed (*Amaranthus palmeri*), white bursage, fourwing saltbush, and allscale. Mesquite Bosque occurs on higher alluvial terraces and near washes, streambanks, alkali sinks, or outwash plains with substantial groundwater.

3.1.12 Desert Dry Wash Woodland (62200)

Desert dry wash woodland is characterized as open to dense, drought-deciduous, microphyllous riparian thorn scrub woodland 30 to 60 feet tall (Oberbauer et al. 2008). This vegetation community is dominated by fabaceous trees, including ironwood (*Olneya tesota*), desert willow (*Chilopsis linearis*), and blue palo verde *(Parkinsonia florida*). Desert dry wash woodland occurs on sandy or gravelly washes and arroyos with braided channels and large drainages.

3.1.13 Freshwater (64140)

Oberbauer et al. (2008) characterizes freshwater as year-round bodies of fresh water, or extremely low salinity, in the form of lakes, streams, ponds, or rivers. Freshwater includes portions of water bodies that are usually covered by water and contain less than 10% vegetative cover (Oberbauer et al. 2008).

3.1.14 Urban/Developed (12000)

Urban/developed land refers to areas that have been constructed upon or disturbed so severely that native vegetation is no longer supported. Developed land includes areas with permanent or semi-permanent structures, pavement or hardscape, landscaped areas, and areas with a large amount of debris or other materials (Oberbauer et al. 2008).

3.1.15 Field/Pasture (18310)

Field/Pasture is characterized by dense habitat with approximately 100 percent cover (Oberbauer et al. 2008). This land includes planted fields that are usually monoculture crops and are irrigated and artificially seeded and maintained. Characteristic species include oat (*Avena* sp.), Bermudagrass (*Cynodon dactylon*), barley (*Hordeum* sp.), and Sorghum (*Sorghum* sp.) (Oberbauer et al. 2008).

3.2 Biological Resources

3.2.1 Plants

Dudek has reviewed the physical characteristics of the Jacumba Valley Ranch project area (including biogeography, elevation, vegetation, soils, etc.) and CDFW's CNDDB and CNPS records to compile a list of special-status plants with potential to occur on site (CDFW 2017, CNPS 2017). Based on the preliminary analysis of the study area, Dudek anticipates the need for a focused rare plant survey for special-status species within the biological study area. The majority of the special-status target species can be observed in early spring (March), late spring (June), and fall (August). Therefore, Dudek recommends conducting three survey passes on the

Jacumba Valley Ranch project area to survey for special-status target plants. Special-status species known to occur within the vicinity of the Project boundary include slender-leaved ipomopsis (*Ipomopsis tenuifolia*) (CDFW 2017). There are 35 special-status plant species covered under the County of San Diego Sensitive Plant List as List A or B that occur within the surrounding quads (County of San Diego 2010a; CDFW 2017; Appendix A).

The following special-status species may have potential to occur within the biological study area based on the project site's location, special-status species ranges and habitat preferences, and Dudek's knowledge of the region: pygmy lotus (*Acmispon haydonii*; List A); Jacumba milk-vetch (*Astragalus douglasii* var. *perstrictus*; List A); Higgins barberry (*Berberis higginsiae*); Tecate tarplant (*Deinandra floribunda*; List A); sticky geraea (*Geraea viscida*; List B); slender-leaved ipomopsis (*Ipomopsis tenuifolia*; List B); desert beauty (*Linanthus bellus*; List B); Mountain Springs bush lupine (*Lupinus albifrons* var. *medius*; List A); spearleaf (*Matelea parvifolia*; List B); desert spike-moss (*Selaginella eremophila*; List B); southern jewelflower (*Streptanthus campestris*; List A); and Parry's tetracoccus (*Tetracoccus dioicus*; List A)

3.2.2 Wildlife

Dudek anticipates the need for a general biological resources survey and habitat assessment for special-status species within the biological study boundary. Special-status wildlife species known to occur within the vicinity of the project boundary include Cooper's hawk and pallid bat (CDFW 2017). There are 24 special-status wildlife species covered under the County of San Diego Sensitive Plant List as Group 1 or 2 that occur within the 9 quad search vicinity (County of San Diego 2010a; CDFW 2017; Appendix B).

The following special-status species may have the potential to occur within the biological study area based on the project site's location, special-status species ranges and habitat preferences, and Dudek's knowledge of the region: California glossy snake (*Arizona elegans occidentalis*; SSC); red diamondback rattlesnake (*Crotalus ruber*; SSC/Group 2); Blainville's horned lizard (*Phrynosoma blainvillii*; SSC/MSCP Covered/Group 2); Cooper's hawk (*Accipiter cooperii*; WL/MSCP Covered/Group 1); tricolored blackbird (*Agelaius tricolor*; BCC/PSE, SSC/MSCP Covered/Group 1); golden eagle (*Aquila chrysaetos*; BCC/FP, WL/MSCP Covered/Group 1); long-eared owl (*Asio otus*; SSC/Group 1); burrowing owl (*Athene cunicularia*; BCC/SSC/MSCP Covered/Group 1); prairie falcon (*Falco mexicanus*; BCC/WL/Group 1); pallid bat (*Antrozous pallidus*; SSC/Group 2); pallid San Diego pocket mouse (*Chaetodipus fallax pallidus*; SSC/Group 2); San Diego desert woodrat (*Neotoma lepida intermedia*; SSC/Group 2); and quino checkerspot butterfly (*Euphydryas editha quino*; FE/Group 1). Additionally, Peninsular bighorn sheep (*Ovis canadensis*) may have some potential depending on the site conditions.

Focused protocol species surveys are anticipated for the following special-status species:

- Burrowing owl surveys in accordance with state or county guidelines;
- Tricolored blackbird surveys if suitable freshwater marsh habitat still exists on site;
- Raptor usage survey to determine migration use (by Swainson's hawk (*Buteo swainsoni*), ferruginous hawk (*Buteo regalis*), falcons, and golden eagle) and nesting use by raptors;
- Quino checkerspot butterfly survey in accordance with federal protocols;
- Peninsular bighorn sheep habitat assessment and focused survey depending on the site conditions/connectivity to desert or Mexican populations;
- A golden eagle assessment would need to occur, but it would be best to attempt to leverage existing data gathered recently by the U.S.G.S and older data collected within the last 10 years for numerous other projects in the vicinity. If the agencies don't approve of this, then focused nest surveys (or occupancy surveys using the U.S.G.S. hexagon survey grid method);
- Possible wildlife corridor study to determine movement patterns across the site and vicinity.

The project location is too far east to support listed arroyo toad and California gnatcatcher; there does not appear to be suitable riparian habitat for least Bell's vireo (*Vireo bellii pusillus*) or southwestern willow flycatcher (*Empidonax traillii extimus*), and too far west to support flat-tailed horned lizard (*Phrynosoma mcallii*). It is not anticipated that other wildlife surveys would be required.

3.2.3 Jurisdictional Aquatic Resources

Jurisdictional aquatic resources, including both wetlands/riparian areas and non-wetland waters/streambeds, mapped in the study area are shown in Figure 3, Jurisdictional Aquatic Resources. Tables 2 provides a summary, in acreages, of these jurisdictional aquatic resources. Many of these resources are also likely to satisfy County RPO criteria.

Table 2
Jurisdictional Aquatic Resources

Jurisdictional Aquatic Resources	Acres
Freshwater Emergent Wetland	0.76
Freshwater Forested/Shrub Wetland	64.68
Riverine	15.34
Total	**80.78**

4 CONCLUSION

A variety of focused surveys are anticipated to be required through coordination with the County and wildlife agencies. Further, basic vegetation mapping and jurisdictional delineations would be required.

However, no critical fatal flaw issues are apparent.

Please feel free to call me at 760.479.4259 or Brock Ortega at 760.479.4254 if you have any questions regarding the contents of this memorandum.

Sincerely,

David Hochart

Att: *Figure 1, Project Location*
Figure 2, Biological Resources
Figure 3, Jurisdictional Aquatic Resources
Appendix A, Special-Status Plant Species Potential to Occur on Site
Appendix B, Special-Status Wildlife Species Potential to Occur on Site

LITERATURE CITED

AOU (American Ornithologists' Union). 2016. *Check-List of North and Middle American Birds: List of the 2,127 Bird Species Known from the AOU Check-List Area.* Accessed October 14. 2016. http://checklist.aou.org/.

CDFW (California Department of Fish and Wildlife). 2017. *California Natural Diversity Database* (CNDDB). RareFind, Version 5.2.14 (Commercial Subscription). Sacramento, California. CDFW, Biogeographic Data Branch. http://www.dfg.ca.gov/biogeodata/cnddb/mapsanddata.asp.

CNPS (California Native Plant Society). 2017. *Inventory of Rare, Threatened, and Endangered Plants of California* (online edition, v8-03). Sacramento, California. CNPS, Rare Plant Program. http://www.rareplants.cnps.org.

County of San Diego. 1997. *Multiple Species Conservation Plan. County of San Diego Subarea Plan.* Adopted October 22, 1997. Prepared by the County of San Diego in conjunction with the U.S. Fish and Wildlife Service, California Department of Fish and Game.

County of San Diego. 2010a. *County of San Diego Guidelines for Determining Significance and Report Format and Content Requirements: Biological Resources*. Fourth Revision. Land

Use and Environment Group, Department of Land Use and Planning & Development Services, Department of Public Works. September 15, 2010.

County of San Diego. 2010b. *County of San Diego Multiple Species Conservation Program South County Subarea Plan Annual Report*. South County Subarea Plan Annual Report Year 12, Reporting Period: January 1, 2009–December 31, 2009. April 14, 2010. Accessed March 2017. http://www.sandiegocounty.gov/content/dam/sdc/parks/RMD/RMPs%20and%20Trails/2009_MSCP_AnnualReport.pdf

Crother, B.I. 2012. *Scientific and Standard English Names of Amphibians and Reptiles of North America North of Mexico, with Comments Regarding Confidence in our Understanding*, edited by J.J. Moriarty. 7th ed. Society for the Study of Amphibians and Reptiles (SSAR). Herpetological Circular, no. 39. August 2012. Accessed 2015. http://home.gwu.edu/~rpyron/publications/Crother_et_al_2012.pdf.

Google Earth. 2017. *Aerial imagery from U.S. Geological Survey*, USDA Farm Service Agency, and DigitalGlobe 1994 to 2016.

Holland, R.F. 1986. *Preliminary Descriptions of the Terrestrial Natural Communities of California*. Sacramento, California. CDFG.

Jepson Flora Project. 2016. *Jepson eFlora*. Berkeley, California. University of California. Accessed October 18, 2016. http://ucjeps.berkeley.edu/cgi-bin/get_JM_name_data.pl.

NABA (North American Butterfly Association). 2016. "Checklist of North American Butterflies Occurring North of Mexico." Adapted from "North American Butterfly Association (NABA) Checklist and English Names of North American Butterflies," eds. B. Cassie, J. Glassberg, A. Swengel, and G. Tudor. 2nd ed. Morristown, New Jersey. NABA. Accessed October 14, 2016. http://www.naba.org/pubs/enames2.html.

Oberbauer, T, M. Kelly, and J. Buegge. March 2008. *Draft Vegetation Communities of San Diego County*. Based on "Preliminary Descriptions of the Terrestrial Natural Communities of California." Robert F. Holland, Ph.D. October 1986.

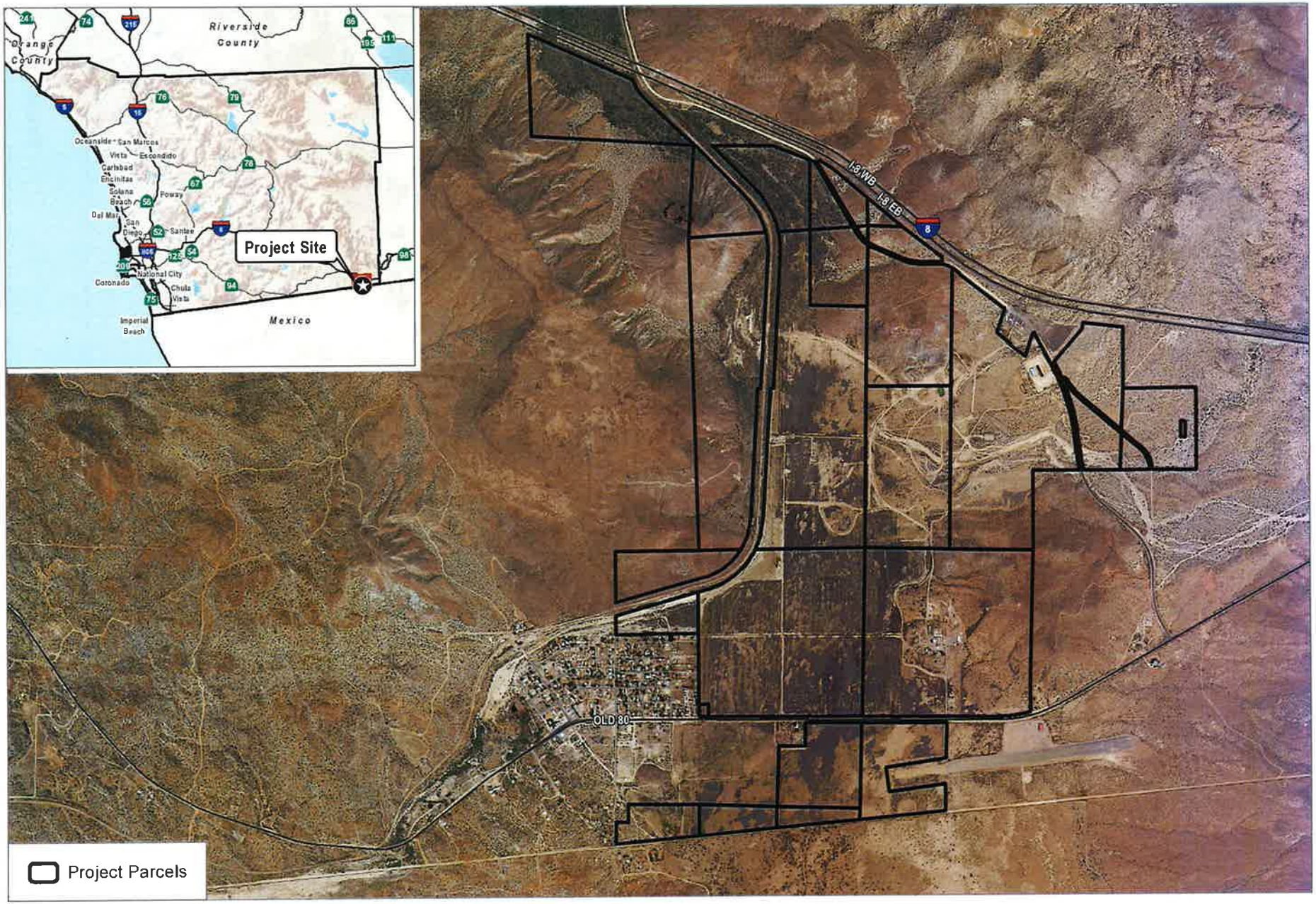
USDA (U.S. Department of Agriculture). 2014. *Natural Resources Conservation Service (NRCS). Web Soil Survey.* Accessed 2014. http://websoilsurvey.nrcs.usda.gov/app/.

USDA. 2017. *Web Soil Survey*. USDA Natural Resources Conservation Service, Soil Survey Staff. Accessed March, 2016. http://websoilsurvey.nrcs.usda.gov/.

USFWS. 2017a. "Critical Habitat and Occurrence Data" [map]. Accessed November 2017. http://www.fws.gov/data.

USFWS. 2017b. "NWI Wetlands for California" [Shapefiles]. National Wetlands Inventory. Data last updated March 5, 2013. Accessed November 2017. http://www.fws.gov/wetlands/Data/State-Downloads.html.

Wilson, D.E., and D.M. Reeder, eds. 2005. *Mammal Species of the World: A Taxonomic and Geographic Reference*, 3rd ed. (MSW3 database). Accessed 2015. http://www.departments.bucknell.edu/biology/resources/msw3/browse.asp.



SOURCE: NAIP 2016

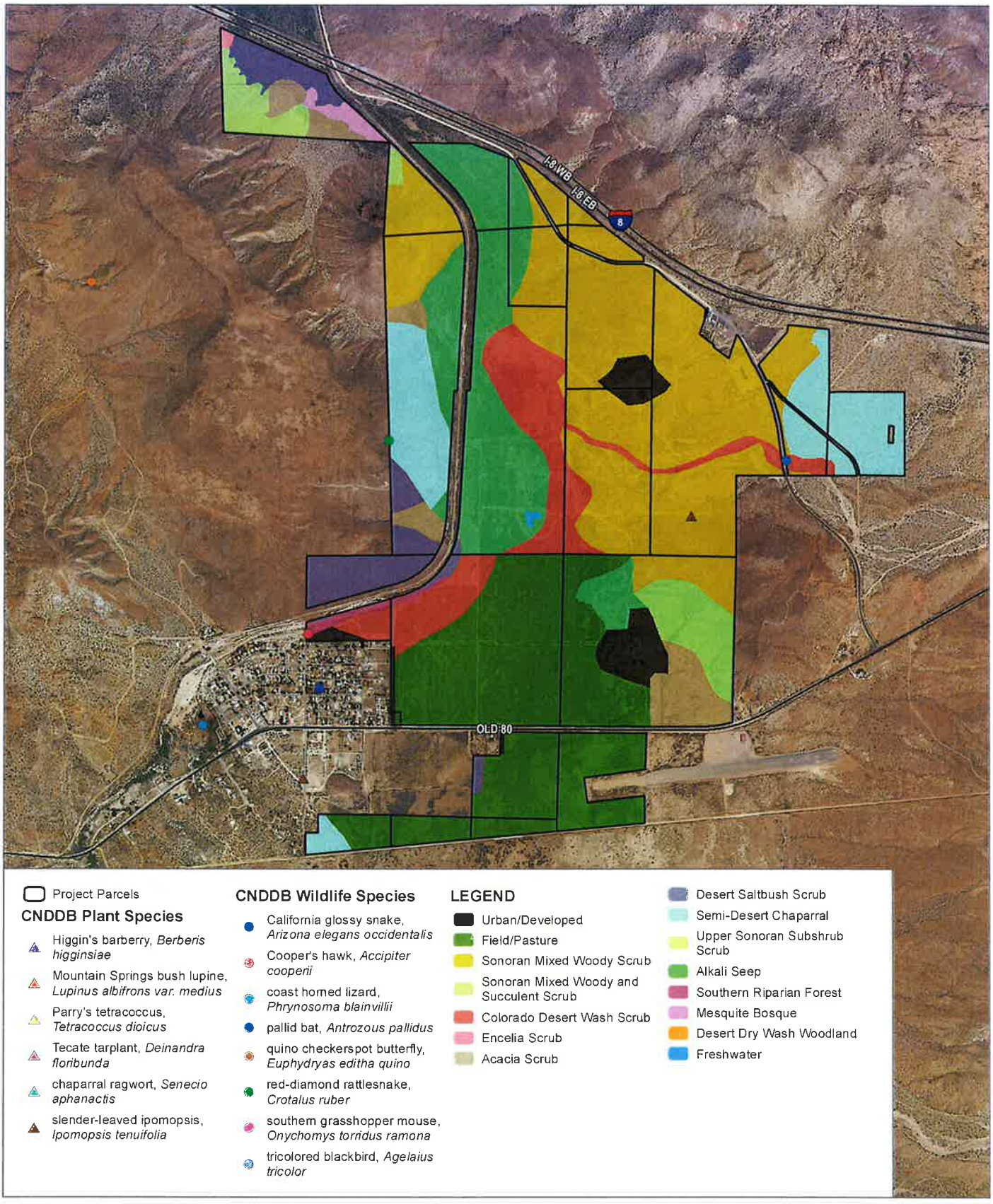
DUDEK

0 1,000 2,000 Feet

FIGURE 1

Project Location

Biological Memorandum for Jacumba Valley Ranch, San Diego County, California



SOURCE: NAIP 2016; CDFW; SanGIS

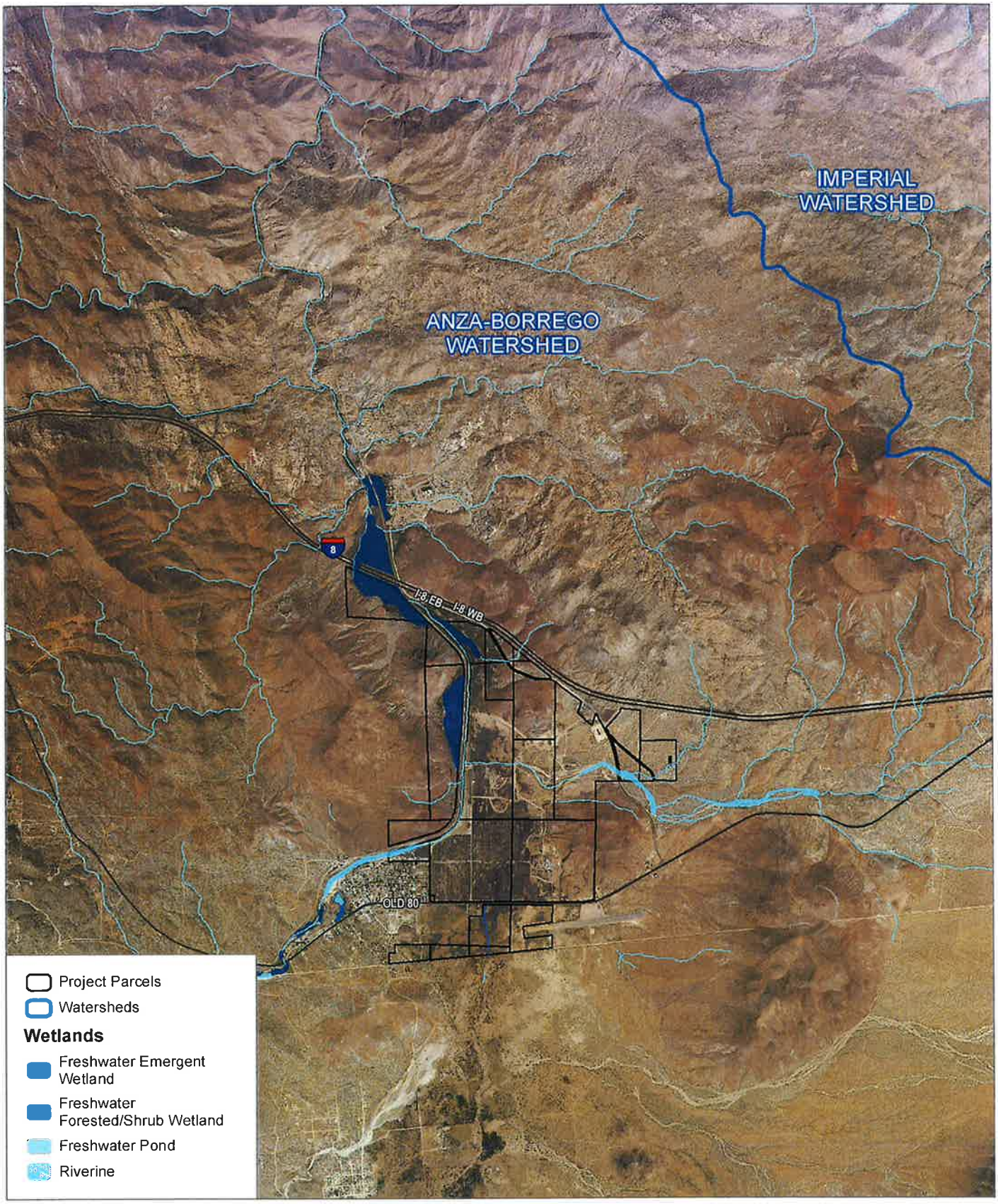
DUDEK

0 1,000 2,000 Feet

FIGURE 2

Biological Resources

Biological Memorandum for Jacumba Valley Ranch, San Diego County, California



SOURCE: NAIP 2016; USFWS; SanGIS

DUDEK

0 1,000 2,000 Feet

FIGURE 3

Jurisdictional Aquatic Resources

Biological Memorandum for Jacumba Valley Ranch, San Diego County, California

APPENDIX A

Special-Status Plant Species
Potential to Occur on Site

Appendix A
Special-Status Plant Species Potential to Occur on Site

Scientific Name	Common Name	Status (Federal/State/ County of San Diego/CRPR/ MSCP)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur
Acmispon haydonii	pygmy lotus	None/None/ List A/1B.3/None	Pinyon and juniper woodland, Sonoran desert scrub; rocky/perennial herb/Jan–June/1705–3935	Potential to occur. Occurrence within 5 miles (CDFW 2017).
Astragalus douglasii var. *perstrictus*	Jacumba milk-vetch	None/None/ List A/1B.2/None	Chaparral, Cismontane woodland, Pinyon and juniper woodland, Riparian scrub, Valley and foothill grassland; rocky/perennial herb/Apr–June/2950–4495	Potential to occur. Occurrence within 5 miles (CDFW 2017).
Astragalus insularis var. *harwoodii*	Harwood's milk-vetch	None/None/List B/2B.2/None	Desert dunes, Mojavean desert scrub; sandy or gravelly/annual herb/Jan–May/0–2330	Not expected to occur. The site is outside of the species' known elevation range and there is no suitable vegetation present. Occurrence within 5 miles (CDFW 2017).
Ayenia compacta	California ayenia	None/None/ List B/2B.3/None	Mojavean desert scrub, Sonoran desert scrub; rocky/perennial herb/Mar–Apr/490–3595	Potential to occur.
Berberis fremontii	Fremont barberry	None/None/ List C/2B.3/None	Joshua tree woodland, Pinyon and juniper woodland; Rocky, sometimes granitic/perennial evergreen shrub/Mar–May/3755–5645	Not expected to occur. The site is outside of the species' known elevation range.
Berberis higginsiae	Higgins? barberry	None/None/None/3.2/ None	Chaparral, Sonoran desert scrub; Rocky, sometimes granitic/perennial shrub/Mar–Apr/2620–3495	Potential to occur. Occurrence within 5 miles (CDFW 2017).
Bursera microphylla	little-leaf elephant tree	None/None/ List B/2B.3/None	Sonoran desert scrub (rocky)/perennial deciduous tree/June–July/655–2295	Not expected to occur. The site is outside of the species' known elevation range.
Calliandra eriophylla	pink fairy-duster	None/None/ List B/2B.3/None	Sonoran desert scrub (sandy or rocky)/perennial deciduous shrub/Jan–Mar/390–4920	Potential to occur.
Carlowrightia	Arizona	None/None/ List	Sonoran desert scrub (sandy, granitic	Not expected to occur. The site is

Scientific Name	Common Name	Status (Federal/State/ County of San Diego/CRPR/ MSCP)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur
arizonica	carlowrightia	B/2B.2/None	alluvium)/perennial deciduous shrub/Mar–May/935–1410	outside of the species' known elevation range.
Caulanthus simulans	Payson's jewelflower	None/None/ List D/4.2/None	Chaparral, Coastal scrub; sandy, granitic/annual herb/(Feb)Mar–May(June)/295–7220	Potential to occur.
Chorizanthe leptotheca	Peninsular spineflower	None/None/ List D/4.2/None	Chaparral, Coastal scrub, Lower montane coniferous forest; alluvial fan, granitic/annual herb/May–Aug/980–6235	Potential to occur.
Chorizanthe polygonoides var. *longispina*	long-spined spineflower	None/None/ List A/1B.2/None	Chaparral, Coastal scrub, Meadows and seeps, Valley and foothill grassland, Vernal pools; often clay/annual herb/Apr–July/95–5020	Potential to occur.
Clarkia delicata	delicate clarkia	None/None/ List A/1B.2/None	Chaparral, Cismontane woodland; often gabbroic/annual herb/Apr–June/770–3280	Potential to occur.
Cylindropuntia fosbergii	pink teddy-bear cholla	None/None/None/1B. 3/None	Sonoran desert scrub/perennial stem succulent/Mar–May/275–2790	Potential to occur.
Cylindropuntia wolfii	Wolf's cholla	None/None/ List D/4.3/None	Sonoran desert scrub/perennial stem succulent/Mar–May/325–3935	Potential to occur.
Deinandra floribunda	Tecate tarplant	None/None/ List A/1B.2/None	Chaparral, Coastal scrub/annual herb/Aug–Oct/225–4005	Potential to occur. Occurrence within 5 miles (CDFW 2017).
Delphinium parishii ssp. *subglobosum*	Colorado Desert larkspur	None/None/ List D/4.3/None	Chaparral, Cismontane woodland, Pinyon and juniper woodland, Sonoran desert scrub/perennial herb/Mar–June/1965–5905	Potential to occur.
Dieteria asteroides var. *lagunensis*	Mt. Laguna aster	None/SR/ List B/2B.1/None	Cismontane woodland, Lower montane coniferous forest/perennial herb/(May)July–Aug/2590–7875	Not expected to occur. No suitable vegetation present. Occurrence within 5 miles (CDFW 2017).
Diplacus aridus	low bush monkeyflower	None/None/ List D/4.3/None	Chaparral (rocky), Sonoran desert scrub/perennial evergreen shrub/Apr–July/2460–3935	Potential to occur.
Ericameria	Laguna	None/None/ List	Chaparral (granitic)/perennial shrub/Sep–	Not expected to occur. The site is

Scientific Name	Common Name	Status (Federal/State/ County of San Diego/CRPR/ MSCP)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur
cuneata var. *macrocephala*	Mountains goldenbush	A/1B.3/None	Dec/3920–6070	outside of the species' known elevation range.
Eryngium aristulatum var. *parishii*	San Diego button-celery	FE/SE/ List A/1B.1/Covered	Coastal scrub, Valley and foothill grassland, Vernal pools; mesic/annual / perennial herb/Apr–June/65–2035	Not expected to occur. The site is outside of the species' known elevation range and there is no suitable vegetation present. Occurrence within 5 miles (CDFW 2017).
Erythranthe diffusa	Palomar monkeyflower	None/None/ List D/4.3/None	Chaparral, Lower montane coniferous forest; sandy or gravelly/annual herb/Apr–June/4000–6005	Not expected to occur. The site is outside of the species' known elevation range.
Eucnide rupestris	annual rock-nettle	None/None/ List B/2B.2/None	Sonoran desert scrub/annual herb/Dec–Apr/1640–1970	Not expected to occur. The site is outside of the species' known elevation range.
Euphorbia abramsiana	Abrams' spurge	None/None/None/2B.2/None	Mojavean desert scrub, Sonoran desert scrub; sandy/annual herb/(Aug)Sep–Nov/-15–4300	Potential to occur.
Euphorbia arizonica	Arizona spurge	None/None/ List B/2B.3/None	Sonoran desert scrub (sandy)/perennial herb/Mar–Apr/160–985	Not expected to occur. The site is outside of the species' known elevation range. Occurrence within 5 miles (CDFW 2017).
Galium angustifolium ssp. *borregoense*	Borrego bedstraw	None/SR/ List A/1B.3/None	Sonoran desert scrub (rocky)/perennial herb/Mar(May)/1145–4100	Potential to occur.
Galium angustifolium ssp. *jacinticum*	San Jacinto Mountains bedstraw	None/None/ List A/1B.3/None	Lower montane coniferous forest/perennial herb/June–Aug/4425–6890	Not expected to occur. The site is outside of the species' known elevation range and there is no suitable vegetation present.
Geraea viscida	sticky geraea	None/None/ List B/2B.2/None	Chaparral (often in disturbed areas)/perennial herb/(Apr)May–June/1475–5575	Potential to occur. Occurrence within 5 miles (CDFW 2017).

Scientific Name	Common Name	Status (Federal/State/ County of San Diego/CRPR/ MSCP)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur
Harpagonella palmeri	Palmer's grapplinghook	None/None/ List D/4.2/None	Chaparral, Coastal scrub, Valley and foothill grassland; Clay; open grassy areas within shrubland/annual herb/Mar–May/65–3135	Potential to occur.
Herissantia crispa	curly herissantia	None/None/ List B/2B.3/None	Sonoran desert scrub/annual / perennial herb/(Apr)Aug–Sep/2295–2380	Not expected to occur. The site is outside of the species' known elevation range. Occurrence within 5 miles (CDFW 2017).
Heuchera brevistaminea	Laguna Mountains alumroot	None/None/ List A/1B.3/None	Broadleafed upland forest, Chaparral, Cismontane woodland, Riparian forest; rocky/perennial rhizomatous herb/Apr–July(Sep)/4490–6560	Not expected to occur. The site is outside of the species' known elevation range.
Horsfordia newberryi	Newberry's velvet-mallow	None/None/ List D/4.3/None	Sonoran desert scrub (rocky)/perennial shrub/Feb,Apr,Nov,Dec/5–2625	Not expected to occur. The site is outside of the species' known elevation range.
Hulsea californica	San Diego sunflower	None/None/ List A/1B.3/None	Chaparral, Lower montane coniferous forest, Upper montane coniferous forest; openings and burned areas/perennial herb/Apr–June/3000–9565	Potential to occur.
Hulsea mexicana	Mexican hulsea	None/None/ List B/2B.3/None	Chaparral (volcanic, often on burns or disturbed areas)/annual / perennial herb/Apr–June/3935–3935	Not expected to occur. The site is outside of the species' known elevation range. Occurrence within 5 miles (CDFW 2017).
Ipomopsis tenuifolia	slender-leaved ipomopsis	None/None/ List B/2B.3/None	Chaparral, Pinyon and juniper woodland, Sonoran desert scrub; gravelly or rocky/perennial herb/Mar–May/325–3935	Potential to occur. Occurrence overlapping project boundary (CDFW 2017).
Isocoma menziesii var. *decumbens*	decumbent goldenbush	None/None/ List A/1B.2/None	Chaparral, Coastal scrub (sandy, often in disturbed areas)/perennial shrub/Apr–Nov/30–445	Not expected to occur. The site is outside of the species' known elevation range. Occurrence within 5 miles (CDFW 2017).
Johnstonella	winged	None/None/ List	Mojavean desert scrub, Sonoran desert	Potential to occur.

Scientific Name	Common Name	Status (Federal/State/ County of San Diego/CRPR/ MSCP)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur
holoptera	cryptantha	D/4.3/None	scrub/annual herb/Mar–Apr/325–5545	
Juncus acutus ssp. *leopoldii*	southwestern spiny rush	None/None/ List D/4.2/None	Coastal dunes (mesic), Meadows and seeps (alkaline seeps), Marshes and swamps (coastal salt)/perennial rhizomatous herb/(Mar)May–June/5–2955	Not expected to occur. No suitable vegetation present.
Lathyrus splendens	pride-of-California	None/None/ List D/4.3/None	Chaparral/perennial herb/Mar–June/655–5005	Potential to occur.
Linanthus bellus	desert beauty	None/None/ List B/2B.1/None	Chaparral (sandy)/annual herb/Apr–May/3280–4595	Potential to occur. Occurrence within 5 miles (CDFW 2017).
Linanthus maculatus ssp. *emaculatus*	Jacumba Mountains linanthus	None/None/None/1B.1/None	Desert dunes (edges), Sonoran desert scrub; Sandy or course, opaque-white, decomposed granite soils of washes and on flats near wash margins/annual herb/(Mar)Apr(May)/1295–1920	Not expected to occur. The site is outside of the species' known elevation range.
Lupinus albifrons var. *medius*	Mountain Springs bush lupine	None/None/ List A/1B.3/None	Pinyon and juniper woodland, Sonoran desert scrub/perennial shrub/Mar–May/1390–4495	Potential to occur. Occurrence within 5 miles (CDFW 2017).
Lycium parishii	Parish's desert-thorn	None/None/ List B/2B.3/None	Coastal scrub, Sonoran desert scrub/perennial shrub/Mar–Apr/440–3280	Potential to occur.
Malperia tenuis	brown turbans	None/None/ List B/2B.3/None	Sonoran desert scrub (sandy, gravelly)/annual herb/(Feb)Mar–Apr/45–1100	Not expected to occur. The site is outside of the species' known elevation range.
Matelea parvifolia	spearleaf	None/None/ List B/2B.3/None	Mojavean desert scrub, Sonoran desert scrub; rocky/perennial herb/Mar–May(July)/1440–3595	Potential to occur. Occurrence within 5 miles (CDFW 2017).
Mentzelia hirsutissima	hairy stickleaf	None/None/ List B/2B.3/None	Sonoran desert scrub (rocky)/annual herb/Mar–May/0–2295	Not expected to occur. The site is outside of the species' known elevation range. Occurrence within 5 miles (CDFW 2017).

Scientific Name	Common Name	Status (Federal/State/ County of San Diego/CRPR/ MSCP)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur
Mentzelia tricuspis	spiny-hair blazing star	None/None/None/2B.1/None	Mojavean desert scrub; sandy, gravelly, slopes, and washes/annual herb/Mar–May/490–4200	Not expected to occur. No suitable vegetation present. Occurrence within 5 miles (CDFW 2017).
Mentzelia tridentata	creamy blazing star	None/None/None/1B.3/None	Mojavean desert scrub; rocky, gravelly, sandy/annual herb/Mar–May/2295–3855	Not expected to occur. No suitable vegetation present.
Mirabilis tenuiloba	slender-lobed four o'clock	None/None/ List D/4.3/None	Sonoran desert scrub/perennial herb/(Feb)Mar–May/750–3595	Potential to occur.
Nemacaulis denudata var. *gracilis*	slender cottonheads	None/None/ List B/2B.2/None	Coastal dunes, Desert dunes, Sonoran desert scrub/annual herb/(Mar)Apr–May/-160–1310	Not expected to occur. The site is outside of the species' known elevation range.
Petalonyx linearis	narrow-leaf sandpaper-plant	None/None/None/2B.3/None	Mojavean desert scrub, Sonoran desert scrub; Sandy or rocky canyons/perennial shrub/(Jan–Feb)Mar–May(June–Dec)/-80–3660	Potential to occur.
Pholistoma auritum var. *arizonicum*	Arizona pholistoma	None/None/None/2B.3/None	Mojavean desert scrub/annual herb/Mar/900–2740	Not expected to occur. No suitable vegetation present. Occurrence within 5 miles (CDFW 2017).
Pickeringia montana var. *tomentosa*	woolly chaparral-pea	None/None/None/4.3/ None	Chaparral; Gabbroic, granitic, clay/evergreen shrub/May–Aug/0–5575	Potential to occur.
Pilostyles thurberi	Thurber's pilostyles	None/None/ List D/4.3/None	Sonoran desert scrub/perennial herb (parasitic)/Dec–Apr/0–1200	Not expected to occur. The site is outside of the species' known elevation range.
Proboscidea althaeifolia	desert unicorn-plant	None/None/ List D/4.3/None	Sonoran desert scrub; gently sloping sandy flats and washes, sometimes roadsides/perennial herb/May–Sep(Oct)/275–3280	Potential to occur.
Pseudorontium cyathiferum	Deep Canyon snapdragon	None/None/None/2B.3/None	Sonoran desert scrub (rocky)/annual herb/Feb–Apr/0–2625	Not expected to occur. The site is outside of the species' known elevation range.

Scientific Name	Common Name	Status (Federal/State/ County of San Diego/CRPR/ MSCP)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur
Selaginella eremophila	desert spike-moss	None/None/ List B/2B.2/None	Chaparral, Sonoran desert scrub (gravelly or rocky)/perennial rhizomatous herb/(May)June(July)/655–4250	Potential to occur. Occurrence within 5 miles (CDFW 2017).
Senecio aphanactis	chaparral ragwort	None/None/ List B/2B.2/None	Chaparral, Cismontane woodland, Coastal scrub; sometimes alkaline/annual herb/Jan–Apr(May)/45–2625	Not expected to occur. The site is outside of the species' known elevation range. Occurrence within 5 miles (CDFW 2017).
Streptanthus campestris	southern jewelflower	None/None/ List A/1B.3/None	Chaparral, Lower montane coniferous forest, Pinyon and juniper woodland; rocky/perennial herb/(Apr)May–July/2950–7545	Potential to occur. Occurrence within 5 miles (CDFW 2017).
Symphyotrichum defoliatum	San Bernardino aster	None/None/None/1B.2/None	Cismontane woodland, Coastal scrub, Lower montane coniferous forest, Meadows and seeps, Marshes and swamps, Valley and foothill grassland (vernally mesic); near ditches, streams, springs/perennial rhizomatous herb/July–Nov/5–6695	Not expected to occur. No suitable vegetation present. Occurrence within 5 miles (CDFW 2017).
Tetracoccus dioicus	Parry's tetracoccus	None/None/ List A/1B.2/Covered	Chaparral, Coastal scrub/perennial deciduous shrub/Apr–May/540–3280	Potential to occur. Occurrence within 5 miles (CDFW 2017).

FE = federally endangered
SE = state endangered
SR = state rare
CRPR = California Rare Plant Rank
CRPR 1A: Plants Presumed Extirpated in California and Either Rare or Extinct Elsewhere
CRPR 1B: Plants Rare, Threatened, or Endangered in California and Elsewhere
CRPR 2A: Plants Presumed Extirpated in California, But More Common Elsewhere
CRPR 2B: Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere
CRPR 3: Plants about which More Information is Needed – A Review List
CRPR 4: Plants of Limited Distribution – A Watch List
.1 Seriously threatened in California (over 80% of occurrences threatened/high degree and immediacy of threat)
.2 Moderately threatened in California (20–80% occurrences threatened/moderate degree and immediacy of threat)
.3 Not very threatened in California (<20% of occurrences threatened/low degree and immediacy of threat or no current threats known)

APPENDIX B

Special-Status Wildlife Species
Potential to Occur on Site

Appendix B
Special-Status Wildlife Species Potential to Occur on Site

Scientific Name	Common Name	Status (Federal/State/ County of San Diego/ MSCP)	Habitat	Potential to Occur
Reptiles				
Arizona elegans occidentalis	California glossy snake	None/SSC/None/None	Commonly occurs in desert regions throughout southern California. Prefers open sandy areas with scattered brush. Also found in rocky areas.	Potential to occur. Occurrence within 5 miles (CDFW 2017).
Aspidoscelis tigris stejnegeri	San Diegan tiger whiptail	None/SSC/Group 2/None	Hot and dry areas with sparse foliage, including chaparral, woodland, and riparian areas.	Potential to occur.
Coleonyx switaki	Switak's banded gecko	None/ST/Group 2/None	Rocklands, especially massive rocks and rock formations at the heads of canyons	Potential to occur.
Crotalus ruber	red diamondback rattlesnake	None/SSC/Group 2/None	Coastal scrub, chaparral, oak and pine woodlands, rocky grasslands, cultivated areas, and desert flats	Potential to occur. Occurrence within 5 miles (CDFW 2017).
Gopherus agassizii	Mohave Desert tortoise	FT/ST/None/None	Arid and semi-arid habitats in Mojave and Sonoran Deserts, including sandy or gravelly locations along riverbanks, washes, sandy dunes, canyon bottoms, desert oases, rocky hillsides, creosote flats, and hillsides	Not expected to occur. The site is outside of the species' known geographic range.
Phrynosoma blainvillii	Blainville's horned lizard	None/SSC/Group 2/Covered	Open areas of sandy soil in valleys, foothills, and semi-arid mountains including coastal scrub, chaparral, valley–foothill hardwood, conifer, riparian, pine–cypress, juniper, and annual grassland habitats	Potential to occur. Occurrence within 5 miles (CDFW 2017).
Phrynosoma mcallii	flat-tailed horned lizard	None/SSC/Group 1/None	Desert washes and flats with sparse low-diversity vegetation cover and sandy soils	Potential to occur.

Scientific Name	Common Name	Status (Federal/State/ County of San Diego/ MSCP)	Habitat	Potential to Occur
		Birds		
Accipiter cooperii (nesting)	Cooper's hawk	None/WL/Group 1/Covered	Nests and forages in dense stands of live oak, riparian woodlands, or other woodland habitats often near water	Potential to occur. Occurrence overlapping project boundary (CDFW 2017).
Agelaius tricolor (nesting colony)	tricolored blackbird	BCC/PSE, SSC/Group 1/Covered	Nests near freshwater, emergent wetland with cattails or tules, but also in Himalayan blackberrry; forages in grasslands, woodland, and agriculture	Potential to occur. Occurrence within 5 miles (CDFW 2017).
Aquila chrysaetos (nesting & wintering)	golden eagle	BCC/FP, WL/Group 1/Covered	Nests and winters in hilly, open/semi-open areas, including shrublands, grasslands, pastures, riparian areas, mountainous canyon land, open desert rimrock terrain; nests in large trees and on cliffs in open areas and forages in open habitats	Potential to occur. Occurrence within 5 miles (CDFW 2017).
Asio otus (nesting)	long-eared owl	None/SSC/Group 1/None	Nests in riparian habitat, live oak thickets, other dense stands of trees, edges of coniferous forest; forages in nearby open habitats	Potential to occur. Occurrence within 5 miles (CDFW 2017).
Athene cunicularia (burrow sites & some wintering sites)	burrowing owl	BCC/SSC/Group 1/Covered	Nests and forages in grassland, open scrub, and agriculture, particularly with ground squirrel burrows	Potential to occur. Occurrence within 5 miles (CDFW 2017).
Falco mexicanus (nesting)	prairie falcon	BCC/WL/Group 1/None	Forages in grassland, savanna, rangeland, agriculture, desert scrub, alpine meadows; nest on cliffs or bluffs	Potential to occur. Occurrence within 5 miles (CDFW 2017).
Laterallus jamaicensis coturniculus	California black rail	BCC/ST, FP/Group 2/None	Tidal marshes, shallow freshwater margins, wet meadows, and flooded grassy vegetation; suitable habitats are often supplied by canal leakage in Sierra Nevada foothill populations	Not expected to occur. The site is outside of the species' known geographic range.

Scientific Name	Common Name	Status (Federal/State/ County of San Diego/ MSCP)	Habitat	Potential to Occur
Vireo bellii pusillus (nesting)	least Bell's vireo	FE/SE/Group 1/Covered	Nests and forages in low, dense riparian thickets along water or along dry parts of intermittent streams; forages in riparian and adjacent shrubland late in nesting season	Potential to occur.
		Mammals		
Antrozous pallidus	pallid bat	None/SSC/Group 2/None	Grasslands, shrublands, woodlands, forests; most common in open, dry habitats with rocky outcrops for roosting, but also roosts in man-made structures and trees	Potential to occur. Occurrence overlapping project boundary (CDFW 2017).
Chaetodipus californicus femoralis	Dulzura pocket mouse	None/SSC/Group 2/None	Open habitat, coastal scrub, chaparral, oak woodland, chamise chaparral, mixed-conifer habitats; disturbance specialist; 0 to 3,000 feet above mean sea level	Potential to occur.
Chaetodipus fallax pallidus	pallid San Diego pocket mouse	None/SSC/Group 2/None	Desert wash, desert scrub, desert succulent scrub, and pinyon–juniper woodland	Potential to occur. Occurrence within 5 miles (CDFW 2017).
Corynorhinus townsendii	Townsend's big-eared bat	None/SSC/Group 2/None	Mesic habitats characterized by coniferous and deciduous forests and riparian habitat, but also xeric areas; roosts in limestone caves and lava tubes, man-made structures, and tunnels	Potential to occur.
Eumops perotis californicus	western mastiff bat	None/SSC/Group 2/None	Chaparral, coastal and desert scrub, coniferous and deciduous forest and woodland; roosts in crevices in rocky canyons and cliffs where the canyon or cliff is vertical or nearly vertical, trees, and tunnels	Potential to occur.

Scientific Name	Common Name	Status (Federal/State/ County of San Diego/ MSCP)	Habitat	Potential to Occur
Lasiurus cinereus	hoary bat	None/None/None/None	Forest, woodland riparian, and wetland habitats; also juniper scrub, riparian forest, and desert scrub in arid areas; roosts in tree foliage and sometimes cavities, such as woodpecker holes	Potential to occur.
Lasiurus xanthinus	western yellow bat	None/SSC/None/None	Valley–foothill riparian, desert riparian, desert wash, and palm oasis habitats; below 2,000 feet above mean sea level; roosts in riparian and palms	Potential to occur.
Lepus californicus bennettii	San Diego black-tailed jackrabbit	None/SSC/Group 2/None	Arid habitats with open ground; grasslands, coastal scrub, agriculture, disturbed areas, and rangelands	Not expected to occur. No suitable vegetation present.
Macrotus californicus	Californian leaf-nosed bat	None/SSC/Group 2/None	Riparian woodlands, desert wash, desert scrub; roosts in mines and caves, occasionally buildings	Potential to occur.
Myotis volans	long-legged myotis	None/None/Group 2/None	Primarily coniferous forests, but also seasonally in riparian and desert habitats; roosts in crevices in cliffs, caves, mines, buildings, exfoliating tree bark, and snags	Potential to occur.
Neotoma albigula venusta	Colorado Valley woodrat	None/None/None/None	Desert areas; closely associated with patches of beavertail cactus and mesquite	Potential to occur.
Neotoma lepida intermedia	San Diego desert woodrat	None/SSC/Group 2/None	Coastal scrub, desert scrub, chaparral, cacti, rocky areas	Potential to occur. Occurrence within 5 miles (CDFW 2017).
Onychomys torridus ramona	southern grasshopper mouse	None/SSC/Group 2/None	Grassland and sparse coastal scrub	Not expected to occur. No suitable vegetation present. Occurrence within 5 miles (CDFW 2017).

Scientific Name	Common Name	Status (Federal/State/ County of San Diego/ MSCP)	Habitat	Potential to Occur
Ovis canadensis nelsoni pop. 2 DPS	Peninsular bighorn sheep DPS	FE/ST, FP/None/None	Dry, rocky, low-elevation desert slopes, canyons, and washes; females near water during lambing season	Potential to occur.
Invertebrates				
Euphydryas editha quino	quino checkerspot butterfly	FE/None/Group 1/None	Annual forblands, grassland, open coastal scrub and chaparral; often soils with cryptogamic crusts and fine-textured clay; host plants include Plantago erecta, Antirrhinum coulterianum, and Plantago patagonica (Silverado Occurrence Complex)	Potential to occur. Occurrence within 5 miles (CDFW 2017).

FE: Federally Endangered
FT: Federally Threatened
BCC: U.S. Fish and Wildlife Service Bird of Conservation Concern
SSC: California Species of Special Concern
FP: California Fully Protected Species
WL: California Watch List Species
SE: State Endangered
ST: State Threatened
PST: Proposed State Threatened
SDL: State Delisted
SS: List Special Animals List, but no other status

Attachment B

Groundwater Resources Memorandum

DUDEK

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MEMORANDUM

To:	Patrick Brown, BayWa Renewable Energy
From:	Trey Driscoll, PG, CHG
Subject:	Groundwater Technical Studies Required for a Major Use Permit through the County of San Diego
Date:	November 2, 2017
cc:	David Hochart, Dudek
Attachment(s):	Figure 1

BayWa Renewable Energy has requested information regarding technical studies to support its Major Use Permit (MUP) pre-application meeting with the County of San Diego (County) to permit the Jacumba Valley Ranch project site (approximately 1,289 acres) for the development of approximately 100 MW's of solar energy facilities. Dudek has provided an estimated scope of work for the evaluation of groundwater resources to support the County MUP application.

The County regulates groundwater through the San Diego County Groundwater Ordinance (County of San Diego, 2013) under the San Diego County Code Title 6, Division 7, Chapter 7. Projects applying for a MUP are required to prepare a Groundwater Investigation, which includes well testing for any on-site or off-site wells proposed to supply project water for construction use and operational supply. Additionally, projects are required to evaluate potential impacts to groundwater resources in accordance with the County Guidelines for Determining Significance – Groundwater Resources (County of San Diego PDS, 2007). The County Guidelines establish thresholds for determining significance for both groundwater quantity and quality.

The Jacumba Valley Ranch has historically been used for farming and agricultural purposes. Irrigation was supplied by on-site production wells installed in the Jacumba Valley alluvial aquifer (Figure 1). Between 1932 and 1977, Jacumba Valley Ranch pumped an average of 2,066 acre-feet per year from the alluvial aquifer. Large-scale agricultural irrigation at Jacumba Valley Ranch ceased after 1977 with lower irrigation production (212 acre-feet to 721 acre-feet per year) continuing through 1994. From 2003 until the end of 2012, Bornt Farms resumed irrigation at Jacumba Valley Ranch. The water demand of Bornt Farms was reported to be in excess of 1 million gallons per day or about 1,120 acre-feet per year. Proposed groundwater pumping for the Jacumba Valley Ranch renewables project would be a small percentage of historical groundwater production form the Jacumba Valley alluvial aquifer.

Dudek has previously completed Groundwater Resources Investigation Reports (Dudek, 2015a and Dudek, 2015b) within the Jacumba Valley Groundwater Basin (Basin) to support MUP efforts for the Jacumba Solar Renewable Energy Project. The results of the Groundwater Resources Investigations as well as the continued groundwater monitoring program indicate that project pumping for the Jacumba Solar project did not have any significant environmental impacts, as determined by the County Guidelines. Currently, Dudek is monitoring wells within the Basin (Well 8, Well 7, Well 6, Well 4, Gas Station Well, Park Monitoring Well, Highland center Well, and JVR Well 2) as part of the Jacumba Community Services District (JCSD) Groundwater Monitoring program (Figure 1). Water level data at these wells is current through 2017. JVR Well 2 is an existing well located on Jacumba Valley Ranch. The remaining seven wells are located in the town of Jacumba Hot Springs. As part of previous work performed in the Basin, Dudek located and recorded manual water level measurements at other existing groundwater irrigation production and monitoring wells on Jacumba Valley Ranch. Historical groundwater level data exists as far back as 1995 but a continuous water level record is not available. Since 1955, water levels in the Jacumba Valley alluvial aquifer have fluctuated up to 61 feet (based on available data) as a result of groundwater production and cyclical wet and dry climactic periods.

Dudek has completed a cursory review of the project vicinity and has identified the mapped vegetation types 'grasslands, vernal pools, meadows, and other herbs' and 'riparian and bottomland habitat' (Figure 1) as potentially groundwater-dependent habitats that will require consultation with the County to determine required level of analysis and monitoring. Additionally, the County has previously required monitoring of groundwater-dependent users within a 0.5-mile radius of the pumping well. If the northwest irrigation well is utilized as the source of on-site project groundwater supply, there appear to be no groundwater-dependent users within a 0.5-mile radius to monitor. It would be recommended to incorporate the results of the ongoing JCSD Groundwater Monitoring Program, as well as the existing on-site groundwater wells, into the project's groundwater monitoring program to evaluate the impact of pumping on groundwater level.

COUNTY SCOPING MEETING

The groundwater investigation for the proposed project must follow established County Guidelines (County of San Diego PDS, 2007). A project-specific scoping meeting is proposed with Mr. James Bennett, County groundwater geologist. Mr. Trey Driscoll, PG, CHG, of Dudek will be the County California Environmental Quality Act (CEQA)-certified consultant in charge for this project. He will be assisted by Mr. Stephen Dickey, PG, CEG, CHG (both professionals are listed as approved CEQA consultants on the County's CEQA Consultant List). Based on the scoping meeting, the County will determine project requirements, including pump testing and on-site or off-site monitoring of wells. If required, the pump test results will be used to evaluate whether the proposed project exceeds the County's significance thresholds for groundwater. In addition to the initial

scoping meeting, Dudek hydrogeologists will attend up to one additional meeting with the County for project scoping.

GROUNDWATER INVESTIGATION WORK PLAN AND WELL TEST PLAN

A well test plan must be prepared and subsequently approved by the County groundwater geologist. The plan details the work to be performed in accordance with Section 67.703.3 of the Groundwater Ordinance (County of San Diego, 2013). The County may require well testing on any proposed project well(s) as well as potentially monitoring all on-site and off-site wells within about a 0.5-mile radius. For this project, there does not appear to be any off-site wells within a 0.5-mile radius, provided that the northwest irrigation well is utilized for production. Therefore, the monitoring network will consist of existing on-site wells and the JCSD monitoring network. The well test will likely require a step-drawdown test (12-hour) followed by a minimum 72-hour constant rate test. Dudek will prepare and submit a Groundwater Investigation Work Plan and Well Test Plan to the County groundwater geologist for review and approval.

WELL TESTING AND WATER QUALITY SAMPLING

Based on previous MUP requirements, Dudek anticipates that the County may require a step-drawdown test followed by a constant rate pump test at each proposed project site well location (to be verified based on the scoping meeting and proposed sources of project water supply). This task includes supplying monitoring equipment, collect groundwater samples, provide supervision of the pump testing, and general project management. At the end of the 72-hour constant rate test, Dudek will collect water quality samples and submit them for laboratory analysis of the following constituents: general minerals, coliform bacteria, fecal and E. coli bacterium, total dissolved solids, inorganic chemicals including nitrate, radionuclides including gross alpha and uranium, and volatiles.

UPDATED GROUNDWATER RESOURCES INVESTIGATION REPORT

Extraction of groundwater resources must comply with the County guidelines, which contain a series of thresholds for determining significance for water quantity and quality. Dudek has previously prepared Groundwater Resources Investigation Reports (Dudek, 2015a and Dudek, 2015b) within the Basin to support MUP efforts for the Jacumba Solar Renewable Energy Project. Dudek will provide an updated Groundwater Investigation Report based on previous report findings. The updated Report will evaluate the well test data collected at each well location and provide a comparative analysis of proposed project groundwater production to historical groundwater production from the Jacumba Valley alluvial aquifer. To evaluate off-site well interference resulting from the proposed project, drawdown at off-site wells will be evaluated.

As with the well test plan, the groundwater investigation report must follow County guidelines detailing the correct report format and contents. Dudek will use available historical on-site and off-site well data, results of the on-site well tests, results of previous water balance analysis (Dudek 2015a and 2015b) and historical groundwater production in the Jacumba Valley alluvial basin to assess the potential for significant impacts, as defined by the County, resulting from the proposed project.

GROUNDWATER MITIGATION AND MONITORING PLAN

Groundwater extraction from the project site has the potential to impact the surrounding area. Therefore, a Groundwater Monitoring and Mitigation Plan (GMMP) must be developed. The GMMP will define limits on potential groundwater production volume and set a threshold for groundwater level decline in wells so that pumping does not unduly impact existing well users. The GMMP will detail groundwater level and production monitoring requirements for on-site wells. The GMMP will outline mitigation measures to be taken should groundwater levels drop below the established thresholds. These mitigation measures may include reduction or cessation of pumping until groundwater levels rebound above the established threshold.

Dudek is pleased to have the opportunity to assist BayWa is this effort. If you need clarification or additional information, please contact me at tdriscoll@dudek.com or (760) 415-1425.

Sincerely,

Trey Driscoll

Trey Driscoll, PG No. 8511, CHG No. 936
Principal Hydrogeologist

REFERENCES

County of San Diego PDS (Planning and Development Services), 2007. *The County Guidelines for Determining Significance – and Report Format and Content Requirements: Groundwater Resources*. March 19, 2007.

County of San Diego, 2013. San Diego County Groundwater Ordinance: An Excerpt from the San Diego County Code of Regulatory Ordinances Amendments Effective March 1, 2013.

Dudek, 2015a. DRAFT Groundwater Resources Investigation Report – Flat Creek Watershed Analysis. Jacumba Community Services District, Jacumba Hot Springs, San Diego County, California. April 2015

Dudek, 2015b. DRAFT 2 Groundwater Resources Investigation Report. Jacumba Community Services District, Jacumba Hot Springs, San Diego County, California. March 2015

SOURCE: BING, SanGIS

FIGURE 1

Project Parcels, On-Site Wells and Off-Site Wells

Jacumba Valley Ranch

DUDEK